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SPINED SOLDIER-BUG REARED ON CELERY LEAF-TYER

By DAYTON STONER,
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In the course of some insectary experiments conducted with possible predators of the celery leaf-tyer *(Phlyctaenia rubigalis* Guen.) at the United States Entomological Field Laboratory, Sanford, Florida, certain observations concerning the habits and biology of the spined soldier-bug *(Podisus maculiventris* Say) were made.

On December 13, 1928, a female *Podisus maculiventris,* taken on a celery plant in an old seed bed, was placed in a small jelly dish in the insectary with three pupae and a half-grown larva of the celery leaf-tyer. Two days later moths had emerged from two of the pupae and the bug held one of the newly-issued moths impaled on her beak and was sucking its body juices.

Until the time of the soldier-bug's death on January 10, 1929, it had fed upon three larvae, a pupa, and two moths of the celery leaf-tyer together with a larva of the southern beet webworm *(Pachyzancla bipunctalis* Fab.). It had been in captivity 27 days.

A day before the bug died it laid a mass of 22 eggs on the floor of the cage. The eggs proved to be fertile and hatched within 11 days. When first noticed, the nymphs were congregated in a compact group near the top of the cage. On subsequent occasions they exhibited a tendency to mass together in this way even when only three survivors remained in the dish.

Although a number of small celery leaf-tyer larvae were continuously available as food for the nymphs, the latter did not feed on them until 15 days after hatching. However, in the meanwhile the nymphs molted once and some of them were observed to have their beaks inserted into the petiole of a sprig of celery that had been introduced into the cage as food for the tyer

larvae. Cannibalistic propensities were exhibited by the Podisus nymphs, for by February 4, 15 days after hatching, only three were alive and one was discovered with the body of another but smaller nymph impaled on its beak. Their gregarious habits appear to be conducive to cannibalism, at least in captivity. On February 22 the smallest of the survivors died, leaving only two of the original 22 alive.

On one occasion, while one of the nymphs was quietly sucking the body juices of a leaf-tyer larva, the other two nymphs approached and began feeding upon the same larva and each tugged and hauled about in an apparent effort to pull it away from the others.

After the nymphs were about 10 days old they were not observed to feed upon the juices of the celery sprigs that were introduced into the cage as food for the larvae, but several celery leaf-tyer larvae, in the third to fifth instars, were destroyed by the bugs.

Three weeks after the bugs hatched a newly emerged celery leaf-tyer moth was placed in the cage where it remained for two days before one of the nymphs fed on it although during this period larvae had been fed upon. From this time moths were introduced at frequent intervals for food of the rapidly growing nymphs and were fed upon freely. For a number of days a live but naked celery leaf-tyer pupa lay untouched on the floor of the cage but on February 25, when the bugs were 32 days old, this, too, had been sucked dry. On February 26 the larger nymph had molted for the last time, 33 days having elapsed since it had hatched; and two days later the smaller nymph transformed to the adult having completed its cycle in 35 days from the time of hatching.

The observations indicate that *Podisus maculiventris* may breed throughout the year in central Florida. The mean temperature out of doors during the incubation period was 65° F.

While this pentatomid does not appear to be of frequent occurrence on celery in the Sanford district, wherever it is present it may be of value in destroying one of the most noxious insect pests of that plant—the celery leaf-tyer.

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ANOTHER IMPORTED ANT

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Probably no state in the union has a larger number of introduced ants than Florida. This peculiar condition is no doubt due to a number of causes, chief among which may be enumerated the following: (1) that Florida is constantly being visited by many tourists; (2) being a seaboard state she is in direct communication with many foreign ports; and (3) on account of the semi-tropical climate nearly any ant that is imported into her borders is almost sure to thrive outdoors.

Some of the imported ants that have been noted to occur in this state are the following: *Monomorium pharaonis* (Linn.), *Solenopsis geminata* subsp. *rufa* (Jerdon), *Tetramorium guineense* (Fabr.), *Wasmannia auropunctata* (Roger), *Tapinoma melanocephalum* (Fabr.), *Paratrechina longicornis* (Latr.) and *Camponotus socius* Roger. That the Argentine ant *Iridomyrmex humilis* Mayr has not yet been recorded from Florida is indeed remarkable.

Recently I received for determination a number of specimens of ants which were collected at Miami, by Mr. S. O. Hill. Among the lot was one species which I had never seen before from North America. With the available literature the ants were determined as a species of *Paratrechina (Nylanderia)*. Realizing that the species was no doubt either a new species or else an imported one, very probably the latter, I submitted specimens to Dr. Wheeler who identified the ants as a variety of *Prenolepis*

(Nylanderia) bourbonica, Forel, the type of which is known from Madagascar. This variety was very probably introduced into Florida on plants.

Mr. Hill in remarking about the habits of the ants stated that the workers were observed running over sand and the pavement of sidewalks at Miami. It would appear that this species is not only well established at Miami but that it is capable of living outdoors. Whether the species will prove to be a house infesting form is not known, but it would appear that there might be a strong possibility of this since a number of our native *Paratrechina (Nylanderia)* have this habit.

Following is the synonymy of the species: *P. bourbonica* Forel, Ann. Soc. Ent. Belg. Vol. 30, p. 210 (1886) worker, female, male. *(Prenolepis nodifera bourbonica)* Reunion, Isle Pemba.

Prenolepis bourbonica, Forel, in Grandidier Hist. Nat. Madagascar, Vol. 20, 2, p. 82, pl. 3, fig. 2 (1891) worker, female, male; Emery, Nova. Caledonia, Zool. Vol. 1, p. 422 nota (1914) worker.

AN OUTBREAK OF THE CORN SYRPHUS FLY

By J. R. WATSON AND A. N. TISSOT

The larvae of *Mesogramma polita* Say, have food habits very unusual for a syrphus fly, most of which feed on aphids and other small insects, tho some are scavengers. The larvae became extremely abundant in a corn field near Waldo, Fla., in early June. They appeared in such large numbers on the tassels and the leaves as to attract attention of the owner of the field and cause him considerable alarm. In response to an S.O.S. from him, the field was visited by the writers. By that time the larvae had almost disappeared; only one was seen. But there were large numbers of pupae, especially on the leaves. In some cases as many as five pupae were taken from a single leaf.

In Insect Life, Volume I, p. 5, there is an account under the name of *Mesograpta polita,* of two similar outbreaks of this syrphus fly. One in New Jersey and the other in Florida. In the previous outbreak in Florida, the larvae were observed to be feeding upon the stalks of corn where they caused soft discolored places. In the New Jersey outbreak they were recorded as feeding exclusively on pollen. In the field at Waldo no damage to the stalks was seen. The larvae apparently confined themselves exclusively to pollen. They had fed extensively on the tassels, and those found on the leaves had undoubtedly been feeding on pollen grains which had fallen there. They had caused no apparent damage to the corn. It seems probable that this insect is by preference a pollen feeder and feeds on the other parts of corn only when forced to do so by hunger. A noteworthy characteristic of this outbreak was the fact that the maggots appeared in such large numbers suddenly and disappeared as suddenly. Twenty-four hours after the farmer had first noticed their presence on the corn, they had almost entirely disappeared, although plenty of adults were found flying about. Puparia collected from this field were found to be highly parasited by two as yet undetermined species of Hymenoptera.

THE SCARABAEIDAE OF FLORIDA

By W. S. BLATCHLEY
Dunedin, Florida

(Continued from Vol. XIV, page 17)

167. (13878). **A. castaneus** (Melsh.).

Length 8.5-10.5 mm. Short ovate, very robust, dilated behind; above pale reddish-brown to black, beneath pale chestnut-brown; clypeus concave on sides, its subapical transverse carina with two large obtuse teeth and a much smaller median one; punctures of thorax smaller and more sparse than in *variolosus*, those of alternate striae of elytra arranged in pairs.

Fort Capron and Enterprise, rare (Sz.).

Genus XLV. ANASTRATEGUS Casey.

Very large, dark brown Scarabaeidae having the pronotum in both sexes with a rather large apical tubercle and postapical oval impression, never armed with long horns in the male; apex of clypeus upturned, obtusely acuminate or broadly rounded; antennal club in our species with joints equal; sutural striae of elytra entire; outer angle of tip of hind tibiae deeply notched; pygidium of male regularly convex, in female, broadly transversely impressed, with impression smooth, shining.

*168. (13888). **A. cognatus** Csy., 1915, 236.

Length 28-30 mm. Elongate convex, sides parallel, very robust; dark reddish-brown, polished, head and front tibiae darker; head thickly, coarsely transversely rugose-punctate; clypeal apex broadly and obtusely rounded; front half of pronotum, including the impression, rugose with coarse, wavy transverse lines enclosing rather coarse punctures, the apical tubercle stout, its apex feebly notched, basal half minutely very sparsely punctate; hind tarsi subequal in length to tibiae, the tarsal joint as long as width of scutellum.

Described from Kissimmee. Dunedin, Jan. 17; a single female from beneath a log.

*169. (13889). **A. splendens** (Beauv.).

Length 26-30 mm. Oblong, suboval, stouter and shorter than *cognatus;* dark chestnut-brown, strongly shining; clypeal apex of male upturned; thorax shorter, with subapical impression larger than in *cognatus*, sculptured much as there; hind tarsi much shorter than tibiae, the basal joint distinctly shorter than width of pronotum.

Tampa, very rare (Sz.); St. Petersburg (Schf.). Lakeland, May 8; Big Pine Key, Oct. (Dav.). Sarasota, Bradentown and

Dunedin, Jan. 26-June 15, a dozen or more specimens at light and crawling along sandy paths and roadsides (Bl.).

Genus XLVI. STRATEGUS Hope.

Very large brown or blackish beetles, the males having a very deep pronotal cavity armed each side of its hind margin by a conspicuous curved horn, the apical tubercle of the preceding genera also prolonged into a similar horn; the pronotum of female with a short apical tubercle, the postapical cavity smaller and more shallow than in *Anastrategus*, but rugosely sculptured as there; mandibles strongly toothed on outer side; sutural striae of elytra in our species evident only near apex; pygidium of sexes subequal in size; post-coxal process of prosternum densely hirsute as in *Ligyrus*.

170. (13895). **S. atrolucens** Csy., 1915, 247.

Length 30-34 mm. Upper surface, a shining polished black, beneath, chestnut-brown; front tibiae blackish; clypeus strongly transversely rugose, its apex obtusely rounded; pygidium very short, almost four times as wide as long.

Florida, without definite station (Csy.). Probably only a melanistic form of *antaeus*.

*171. (13896). **S. antaeus** (Fabr.).

Length 27-32 mm. Above dark chestnut-brown to blackish, beneath dark reddish-brown; clypeus less coarsely rugose, its apex often subtruncate; pygidium scarcely three times as wide as long. Pronotal horns of male variable in length, stoutness and sculpture, always transversely rugose at base, sometimes also nearly to apex, but usually only sparsely punctate above the base.

Not rare (Sz.); Buck Key (Sz. Ms.); Gainesville and Fort Lauderdale (Ag. Coll.); South Jacksonville, Ortega, LaGrange, Useppa Island and Miami, May-November (Dav.). Ormond, June 12; Dunedin, March 8-Dec. 16; crawling along roadsides (Bl.).

In addition to the above *S. julianus* Burm. has been recorded by Wickham from Sevenoaks. As the species is definitely known only from Mississippi to Texas, the record was probably based on a specimen of *antaeus*.

GENUS XLVII. DYNASTES Kirby.

Very large smooth greenish-gray Scarabs, the head of male bearing a horn which projects backward to meet a longer stouter forward-projecting one of thorax. Female without thoracic horn

or impression and with only a small median tubercle on head; front tibiae tridentate; front tarsi of males very long and slender.

*172. (13908). **D. tityus** Linn.

Length 32-47 mm. Oblong-oval, very convex. Greenish-gray, the elytra mottled with numerous piceous spots which vary much in size and distribution; female sometimes with entire upper surface piceous-brown; large thoracic horn of male with a short slender acute one each side of base.

Enterprise, rare (Sz.). Gainesville, "found occasionally beneath old logs; abundant beneath arc-lights in July" (Doz.). Lake Butler (Ag. Coll.); Tampa and Elford (P. B. Coll.). Ormond, June 11; Dunedin, June 15; at light (Bl.). Apparently more scarce in Florida than in southern Indiana, where it is of frequent occurrence. It is the largest Scarab found in eastern North America and gives off a strong but not unpleasant odor when handled. The larvae are said to live in rotten wood.

Genus XLVIII. PHILEURUS Latreille.

Elongate-oblong, subdepressed black beetles of large or medium size, resembling *Passalus* and having the head and thorax alike in the sexes, the former armed with two short horns or tubercles, the latter with a single small tubercle at the front end of a deep longitudinal median groove.

*173. (13911). **P. truncatus** (Boh.).

Length 26-38 mm. Upper surface and legs black, shining, piceous beneath; head in both sexes with two erect processes about as long as head and curved backward near tip; clypeal apex upturned, acute; apical third of thorax sharply declivent, the declivity roughly scabrous, elsewhere finely, sparsely punctate, the tubercle distant from the front margin; elytral striae regular, rather deep, coarsely punctate; pygidium very finely punctate.

Throughout the State but uncommon. Enterprise, June (Sz.); St. Augustine (Ham.); LaGrange, June 24; Everglade, August (Dav.); Lake City and Gainesville (Ag. Coll.); Fruitland Park (Fall). Ormond, June 12; Dunedin at light, June 10, Oct. 1; in rotten log, Nov. 19; R. P. Park, June 1 (Bl.).

174. (13917). **P. sulcifer** Csy., 1915, 269.

Length 19-22 mm. Black, shining; head small, in this species and the next, armed with two small tubercles; thorax less than one-half wider than long; scutellum wholly smooth. These are the only definite characters given in Casey's description, distinguishing this so called species from the next, and it is probably only a form of *valgus*.

"Louisiana to Florida," (Csy.). No other record.

*175. (——). **P. valgus** (Linn.).

Length 19-22 mm. Black, shining, prosternum and front femora pice-

ous; head wider, nearly one-half the width of thorax, the clypeal apex upturned, obtuse; thorax three-fifths wider than long, its apical third gradually declivent, its punctures coarse, crescentic, each enclosing a fine puncture, the tubercle placed near its front margin; basal half of scutellum with numerous punctures; elytral striae coarsely punctate, intervals alternating in width and height.

Tampa and Enterprise, rare (Sz.). Everglade and Big Pine Key (Dav.). Dunedin, June 4, at light; Dec. 24, burrowing in sand near fresh cow dung; R. P. Park, March 18 (Bl.). This is the P. *floridanus* Csy. (1915, 270), evidently described from a single Florida male. While he makes some general remarks regarding *valgus* he does not include it in his key, nor give any characters separating his species from it, though he makes the *P. castaneus* Hald., from Alabama, a synonym of it. The same form as that found in Florida, occurs quite frequently in southern Indiana, so that Casey's name, even if valid, is a misnomer.

Subfamily CETONIINAE

Medium sized somewhat rhomboidal Scarabs more or less flattened above and having the mandibles feebly developed, usually concealed; front coxae conical, prominent; antennae 10-jointed (9-jointed in *Roplisa)*, club 3-jointed; pygidium exposed; tarsal claws simple and equal. In certain genera the side pieces of the mesosternum (mes-epimera) are projected upward to form a small plate visible from above at the shoulders between the thorax and elytra. In flying the Cetonids only partially raise the elytra and slip the inner wings out from the side. They feed for the most part on pollen, the sap of trees, or the juices of fruits, fly about by day and at night or in rainy weather conceal themselves beneath loose bark or other cover.

KEY TO TRIBES OF FLORIDA CETONIINAE

a. Mes-epimera visible from above; elytra sinuate on the sides behind the humeri.

b. Mandibles small, membranous; mentum normal; angles of thorax not nodulose; color not black.

c. Scutellum covered by the basal lobe of pronotum; head of both sexes with a clypeal and frontal spine.
—Genus XLIX. Tribe GYMNETINI.

cc. Scutellum not covered by the thorax; head unarmed.
—Genera L. and LI. Tribe CETONIINI.

bb. Mandibles with outer part corneus; mentum forming a deep cup-shaped cavity; thorax with front and hind angles nodulose and impressed; color wholly black or piceous.
Genus LII. Tribe CREMASTOCHEILINI.

aa. Mes-epimera not visible from above; sides of elytra not sinuate; thorax subhexagonal; pollen feeding species.

Genera LIII-LVI. Tribe TRICHIINI.

Genus XLIX. Cotinis Burmeister.

Species above the medium in size, having, as in the next three genera, the mes-epimera visible from above; head in both sexes with an erect clypeal process and a frontal horizontal spine; pronotum with an elongate basal lobe almost entirely concealing the scutellum; side margins of elytra feebly sinuate.

*176. (13931). **C. nitida** (Linn.).

Length 20-23 mm. Elongate-oval, depressed above; thorax and elytra velvety green with sides dull yellow; head, under surface and tibiae usually a brilliant green; femora and sometimes the abdomen dull yellow. Other characters as above given.

Lake City and Gainesville (Ag. Coll.); Cedar Keys, July (P. B. Coll.); Enterprise (Dietz); New Augustine (Dav.). Dunedin, one specimen only, June 5, at light. Formerly listed as an *Allorhinus*, a genus confined to South America. Apparently more common in some of the northern States than in Florida.

Genus L. EUPHORIA Burmeister.

Species of medium or rather small size possessing the characters of the subfamily and having the head unarmed; apex of clypeus without teeth; thorax without a basal lobe, the side margins entire; scutellum wholly visible; side margins of elytra deeply sinuate; mesosternum with a smooth and glabrous plate or process between the coxae.

*177. (13935). **E. limbalis** Fall, 1905. 273.

Length 12-14 mm. Oblong or subrhomboidal, depressed above, almost glabrous; upper surface shining green, elytra with a few scattered whitish spots; side margins of thorax narrowly, of elytra more broadly, brownish; femora and sides of abdomen reddish-brown; ends of ventrals 1-4 each with an oblong white spot, pygidium with four smaller pale spots; clypeus oblong, deeply concave, its margins strongly reflexed, apex broadly rounded; antennal club of male in this and the next two species much longer than in female.

This is the "*fulgida* Fabr. var. Enterprise, common" (Sz.). Gainesville, May 31 on chinquepin (Ag. Coll.). Biscayne Bay and Buck Key (Sz. Ms.); Miami (Schf.); Marion Co. and Palm Beach (Csy.). Chokoloskee, June 1; R. P. Park, Dec. 17, one; in March and April, very common on the wing in the afternoon in the paths near the Lodge, burrowing in the edges of a pile

of dirt-covered kitchen refuse, and, attracted by the odor of leather, flying in numbers about and alighting on my shoes. Probably occurs throughout the State. Recorded by Wickham from Enterprise as *E. fulgida* but that species is of more northern distribution.

*178. (13940). **E. inda** Linn.

Length 13-16 mm. Oblong-oval, narrowed in front; thorax, sterna and femora thickly pubescent; head and thorax piceous; elytra dull brownish-yellow with scattered black spots; under surface dark brown, shining; clypeus subquadrate, apex broadly rounded, margins narrowly reflexed; mesosternal process more than twice as wide as long.

"Rare" (Sz.); Lake City (Ag. Coll.); Lake Okeechobee and Winter Haven (P. B. Coll.). Gainesville, Oct. 9; "occurs on blossoms of various plants but uncommon" (Doz.). Dunedin, taken but once, Jan. 22, while sweeping in a garden (Bl.).

179. (13952). **E. nitens** Csy.

Length 11.5-14.5 mm. Oblong-oval; above black, very shining, glabrous and with a strong deep blue tinge, rarely greenish; under surface and legs shining black, the sterna sparsely pubescent; clypeus as long as wide, sides parallel, apex obtusely rounded; thorax and elytra coarsely sparsely punctate, the latter with a few vague whitish or tomentose lines or spots.

This is the *E. melancholica* Horn, nec. Gory, and is listed by Schwarz as "common"; also by Hamilton from Lake Worth, and by Schwarz (Ms.) from Biscayne Bay, but it was probably confused with *sepulchralis* and its occurrence in the State is very doubtful, its main distribution being from Kansas to Texas and Mexico.

*180. (13953). **E. sepulchralis** (Fabr.).

Length 10-14 mm. Oblong or oblong-oval; above dark brownish-bronzed, feebly shining, sparsely pubescent; sides of thorax with a submarginal whitish tomentose line; elytra with numerous short sinuous transverse whitish lines; under surface and legs polished black with a coppery tinge; clypeus as in *nitens;* disk of elytra with two obtuse costae the sides transversely rugose; antennal club of the sexes subequal in length.

Common throughout the State, especially so in spring on the heads and in the leaf axils of thistles. Recorded from 14 stations, and at hand from seven others. The description of the var. *floridana* Csy. (1915, 32) has no fixed characters to separate it from the typical form, and the name is superfluous.

181. (13955). **E. scolopacea** Casey, 1915, 322.

Length 8.8-11 mm. "Body narrower and more rhomboidal (than in *sepulchralis);* pale piceo-rufous, not evidently metallic; sides of thorax sel-

dom even with disintegrated tomentum; elytra narrower, distinctly elongate, the tomentose lines and spots fine" (Csy.).

"North Carolina to Florida; very abundant" (Csy.). No other record.

Genus LI. STEPHANUCHA Burmeister.

Species closely allied to *Euphoria*, and by Horn and most American authors, placed under that name. They differ in having the body more convex, and especially in having the apex of clypeus with four small spiniform teeth, the two median ones somewhat closer and arising from a common base; thorax with base rounded, not sinuate as in most species of *Euphoria*.

*182. (13964). **S. areata** (Fabr.).

Length 10.5-12 mm. Oblong-oval, convex; head, thorax and under surface black, feebly bronzed; elytra dull yellow, almost glabrous, the narrow base, humeri, apex and scattered spots on sides, black; thorax thickly punctate, each puncture bearing a short suberect hair, the sides without tomentose whitish area; teeth of front tibiae short, triangular.

Gainesville (P. B. Coll.); "rather rare, Jan. 16-Feb. 19; taken only along sandy roads" (Doz.). Ormond, April 11 (Bl.).

*183. (13965). **S. thoracica** Csy., 1915, 339.

Length 11.5-11.7 mm. Differs mainly in the thorax having a whitish tomentose area each side; elytra usually with sutural dark line narrower and piceous spots on humeri and near apex smaller; teeth of front tibiae long and spiniform, the lower two slightly bent downward.

"Florida" (Csy.); Gainesville (Schf.). Dunedin, Feb. 2, crawling along a sidewalk (Bl.).

Genus LII. CREMASTOCHILUS Knoch.

Oblong, subdepressed black species having the mentum cup-shaped; mandibles with outer part thickened; clypeus semicircular, strongly reflexed; thorax in Florida species with both apical and basal angles nodulose; upper surface coarsely, more or less rugosely punctate; mesosternum not protuberant; last spiracle near the hind margin of the fifth ventral. They occur on the ground, usually beneath chips and stones in or near the nests of ants.

184. (13972). **C. harrisi** Kirby.

Length 10-11 mm. Elongate-oblong; black, moderately shining, front portion of thorax almost smooth, highly polished; disk without an impressed line; nodulose shining front and hind angles of thorax separated from the disk by a deep impression; hind portion of mentum deeply and broadly notched; punctures of upper surface each bearing a short prostrate hair.

Fort Capron, Lake Harney and Tampa, rare (Sz.); Lake Worth (Ham.); Enterprise (C. & L.).

*185. (13979). **C. squamulosus** Lec.

Length 8.3-8.5 mm. Elongate-oblong; black, rather strongly shining; thorax coarsely punctate throughout, the punctures of both it and elytra each bearing a short erect plumose seta; hind portion of mentum subacute, with a small narrow notch; front angles of thorax limited within by a deep impression, median longitudinal line of disk distinct.

Florida (Horn); St. Augustine (Ham.); Gulfport (Schf.). Sarasota, Mch. 3, one beneath bark of pine, in company with ants; Dunedin, Feb. 9, one crawling on a sidewalk (Bl.).

Genus LIII. GNORIMELLA Casey.

This genus and those which follow comprise the tribe Trichiini, in which the mes-epimera are not visible from above; side margins of elytra not sinuate; scutellum always exposed; mesosternum not protuberant. In *Gnorimella* the antennae are 10-jointed; mentum very large with a broad, deep apical sinus; elytra longer than wide, glabrous; head, pronotum and sterna densely pubescent; hind tarsi much longer than tibiae.

186. (14013). **G. maculosa** (Knoch).

Length 12-14 mm. Oblong-oval, subdepressed; black, feebly shining; elytra brownish-yellow, each with three rows of black spots, the humeral umbones and a nodule near apex, polished; clypeus transverse, nearly flat, its apical margin subtruncate, female, deeply sinuate, male; pygidium pruinose, finely, sparsely pubescent.

Cedar Keys, one specimen (Sz.); Lake City, March (Ag. Coll.); Winter Haven, Dec. 20 (P. B. Coll.). Apparently scarce everywhere. I have not taken it in Florida and have but one from Indiana.

Genus LIV. ROPLISA Casey.

Rather small, narrow, oblong-oval species having the antennae only 9-jointed; mentum narrower, flat, with a small deep front sinus; thorax shining, and with an impressed deltoid figure; hind tarsi and tibiae subequal in length.

187. (14014). **R. floridana** Csy., 1915, 380.

Length 6.8-8.2 mm. "Head and pronotum shining black, the disk of latter with an open V-shaped impressed line of yellow tomentum, the margins also tomentose with yellow; elytra opaque, rufous, the sides broadly from before the middle, the apex and the suture broadly in more than apical half, black; legs and abdomen testaceous" (Csy.).

"Florida, two examples" (Csy.). No other record.

Genus LV. TRIGONOPELTASTES Burmeister.

Rather small, oblong-oval species, having the upper surface subglabrous and opaque; thorax black, with a large reversed deltoid yellow impression on middle; elytra, as in the next genus, conjointly not longer than wide; front tibiae bidentate, male, tridentate, female.

*188. (14015). **T. delta** (Forst.).

Length 7.8-10 mm. Head black; clypeus and a transverse line between eyes, yellow; thorax black, all the margins and the deltoid impression, also two spots on scutellum and a line behind it, yellow; elytra reddish-brown, each with an oblique wedge-shaped spot between humerus and suture, and two spots on apical half, black, these spots variable in form and size; pygidium and under surface densely clothed with yellow scales, the former with median line and apex usually naked.

Frequent throughout the State, occurring from March to December. At Gainesville it was found on chinquepin blossoms, April 28, and on flowers of *Salvia,* Cherokee rose and goldenrod from June to August (Doz.). At Dunedin and R. P. Park it was taken from flowers of various kinds, March-December; frequent at light in June.

Genus LVI. TRICHIOTINUS Casey.

This genus comprises the species formerly listed under the name *Trichius.* They are oblong, subdepressed species differing from *Trigonopeltastes* mainly in lacking the deltoid impression of thorax and in having the front tibiae bidentate in both sexes. The thorax is narrower than elytra, rounded at base and, as well as the head and sterna, thickly pubescent with suberect hairs. They occur on flowers during the day and fly quickly when approached.

189. (14016). **T. piger** (Fabr.).

Length 8.5-11 mm. Head and thorax piceous or greenish; elytra reddish-brown to piceous, each with two short oblique whitish bars on side, the space between and behind these blackish; body beneath and pygidium rufous; elytra in this and the next three species each with two obtusely convex costae, the flat intervals between them finely and densely punctate; pygidium and under surface reddish-brown, the former thickly pubescent and with a white scaly patch at sides; front tibiae of male in this and *texanus* without a spur.

Common (Sz.); Crescent City and Tampa (Wick.); St. Augustine (Fall); Gainesville, May-June, on flowers of Jersey tea, magnolia, etc. (Doz.); Enterprise (Dietz); Wauchula on wild rose (Ag. Coll.).

190. (14017). **T. texanus** (Horn), 1876, 195.

Length 10.5-12.8 mm. Deep black and shining throughout, the elytra with pale bars on sides long and oblique as in *piger;* pygidium with an elongate spot of white scales each side; front tibiae of male with inner edge very broad.

"Occurs in Texas and Florida" (Horn); Lake Worth (Ham.); Enterprise (Dietz); Gainesville, May 20, on chinquepin (Doz.); Ft. Myers (Wick.).

*191. (14020). **T. rufobrunneus** Csy., 1915, 385.

Length 9.7-11.7 mm. Pale red-brown throughout, the area between the short narrow white bars on sides of elytra a darker brown; pygidium almost devoid of hairs, the sides each with a dense elongate-oval patch of white tomentum; thorax narrow, scarcely as wide as long, evenly and closely punctate throughout.

Gainesville and Enterprise (Dietz); Marion Co., Florida, 12 males (Csy.); Dunedin, March 30-April 13 (Bl.).

*192. (14021). **T. obesulus** Csy., 1915, 385.

Length 9.3-11.8 mm. Head and pronotum black with faint greenish lustre; elytra black, the disk in part reddish-brown, the area between and behind the pale transverse bars on sides always black; pygidium piceous or rufescent, with pubescence as in *rufobrunneus;* thorax distinctly wider than long, the disk rugose-punctate in front, sparsely punctate near hind angles.

Type from Jacksonville (Csy.). Enterprise (Dietz). Ormond, April 14, Dunedin, April 12, on flowers of wild plum; June 10 at porch light (Bl.).

193. (14025). **T. affinis** (G. & P.).

Length 8-9.3 mm. Oblong-oval; head, thorax, under surface and legs black with a greenish tinge; elytra usually in large part reddish-brown, the sides black with the usual two oblique whitish lines and black velvety space between and behind them; head densely, thorax more sparsely punctate, the latter with a median impressed line; second and fourth intervals of elytra sparsely punctate; third and fifth in this and the remaining species but feebly convex; pygidium nude at middle, the apex, base and white tomentose areas on sides with numerous long white hairs.

Enterprise (C. & L.). La Belle, April 27, common; Deep Lake, April 12-14 (Dav.). As the usual distribution of *affinis* is more northern, these records may belong to *T. obesulus* Csy.

*194. (14027). **T. bibens** (Fabr.).

Length 10.8-12 mm. Head, thorax, body beneath and legs, bright metallic green; elytra reddish-brown, with umbone, and often a spot at apex, of fifth interval green, the usual two white lines on sides wholly wanting; intervals almost equal in width, the second and fourth rather thickly and

finely punctate; head and thorax clothed with short erect hairs, sterna densely pubescent; pygidium sparsely pubescent throughout.

Dunedin, April 15, one taken while sweeping herbage in pine woods. No other state record.

195. (14028). **T. viridulus** (Fabr.).

Length 9-10.7 mm. Deep metallic green throughout; sides of elytra as in *bidens* with mere traces of the pale bands and without the usual opaque velvety spaces, the intervals subequal in width and irregularly punctate; pygidium sparsely pubescent, but with a narrow white tomentose area on sides; front tibiae of male, as in *bibens*, with the two teeth small and approximate; those of female much longer, acute and relatively more distant.

Enterprise, rare (Sz.); St. Augustine (Ham.). Gainesville, rare, May 23, on flowers of dwarf papaw and chinquepin (Doz.); May 31, on wild rose (Ag. Coll.); Ft. Myers and LaBelle, April (Dav.).

195a. (14028a). **T. viridulus semiviridis** (Csy.), 1915, 389.

Differs from the typical form in having the elytra testaceous with feeble green lustre, darker green at the humeri and external apical angles; pale transverse lines of elytra more distinct, the hind one much longer; pygidium with lateral tomentose areas larger, almost meeting across the base.

Marion Co., Florida (Csy.). Enterprise (Dietz).

*196. (14029). **T. lunulatus** Fabr.

Length 9-11 mm. Blue-back throughout; elytra with the usual whitish transverse lines distinct; also with a prominent post-scutellar dash of white tomentum; entire upper surface sparsely clothed with erect bristly hairs, those of scutellum very conspicuous; elytral intervals alternating somewhat in width and convexity, all sparsely and relatively coarsely punctate; pygidium almost nude at middle, the sides as well as those of fifth ventral with elongate spots of white tomentum.

La Belle, South Bay of Lake Okeechobee, and Deep Lake, April 12-May 2, common (Dav.). Gainesville, May 26 (Fattig). R. P. Park, April 6, on flowers of dwarf palmetto (Bl.).

ERRATA FOR PAPER ON FLORIDA SCARABAEIDAE

Vol. XI (1927) p. 45, line 23, "one" should be "ones."

Vol. XI (1927) p. 60, Subfamily VIII, DYNASTINAE should be Subfamily IX, and Subfamily IX, CETONIAE should be Subfamily X.

Vol. XII (1928) p. 26, No. 60 should be **A. solitarius** Blatch.

Vol. XIII (1929) p. 53, No. 108 should be **P. ephilida** (Say).

NOTES ON UTAH COLEOPTERA[1]

By GEORGE F. KNOWLTON

The insect collection at the Utah Agricultural Experiment Station has been expanding noticeably during the past few years; however at the present time only a small portion of the insects have been named. The writer takes this opportunity to thank Dr. E. C. Van Dyke, Mr. J. N. Knull, and Mr. M. C. Lane for their kindness in determining much of the material herein recorded.

COLEOPTERA

Family CICINDELIDAE

Cicindela pusilla Say

Lynndyl, July 1, 1929 (Knowlton); Lewiston, June 16, 1924 (Knowlton).

Cicindela imperfecta Lec.

Lewiston, June 16, 1924 (Knowlton).

Family SILPHIDAE

Necrophorus marginatus Fab.

Logan, June 21, 1928 (Knowlton). Also collected at Franklin, Idaho, May 24, 1923 (Knowlton).

Silpha ramosa Say

Bountiful, June 2, 1929 (Pack); Corinne, June 5, 1929 (Knowlton); Lewiston, October 10, 1929 (Pack).

Silpha bituberosa Lec.

Larvae defoliating young sugar-beet plants at West Weber, May 1927 (Knowlton); Hooper, May 1927 (Knowlton).

Family STAPHYLINIDAE

Gyrohypnus gularis (Lec.)

Greenville, May 10, 1923 (Knowlton); Logan, April 17, 1923 (Knowlton).

Family MELYRIDAE

Collops reflexus Lec.

Logan, July 9, 1923 (Knowlton).

Family CLERIDAE

Trichodes ornatus Say

In flowers of sego lily at Logan, June 21, 1923 (Knowlton); Clarkston, July 1925 (Knowlton).

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[1]Contribution from Department of Entomology, Utah Agricultural Experiment Station

*Unless otherwise indicated, locality is in Utah.

Publication authorized by Director, March 7, 1930.

Trichodes nutalli Kby.

Clarkston, June 15, 1927 (Knowlton); Logan, June 21, 1923 (Knowlton); Wellsville, July 29, 1903.

Hydnocera scabra Lec.

Bountiful, August 16, 1929 (Pack).

Family MELOIDAE

Pyrota terminata Lec.

Logan, July 1923 (Knowlton).

Epicauta puncticollis (Mann.)

Brigham City, July 5, 1929 (Knowlton and Bowen); Damaging alfalfa-seed crop blossoms west of Smithfield, July 3, 1923 (Knowlton).

Epicauta ferruginea (Say)

Benson, July 21, 1909 (Hoff); Blue Creek, July 26, 1929 (Knowlton); Bountiful, August 18, 1929 (Pack and Janes); Cache Junction, August 12, 1909 (Titus); Logan, August 19, 1927 (Knowlton); Pleasant Valley, July 18, 1906.

Epicauta sericans Lec.

On beets at Bear River City, August 10, 1927 (Knowlton); on beets at Logan, July 10, 1907 (Horton); Salt Lake City, June 14, 1908 (Titus).

Epicauta maculata (Say)

Corinne, June 27, 1929 (Knowlton and Bowen); Curlew, August 20, 1929 (Knowlton); sugar-beets at Fielding, September 2, 1925 (Knowlton); Grantsville, August 6, 1929 (Knowlton); Lake Point September 24, 1929 (Knowlton); Newton, July 1923 (Knowlton); on beets at Saratoga, August 26, 1929 (Knowlton); Skull Valley, June 26, 1929 (Knowlton and Bowen); Smelter, July 18, 1909 (Titus); Snowville, August 5, 1929 (Knowlton); Taylorsville, June 25, 1929 (Knowlton).

(To be continued)

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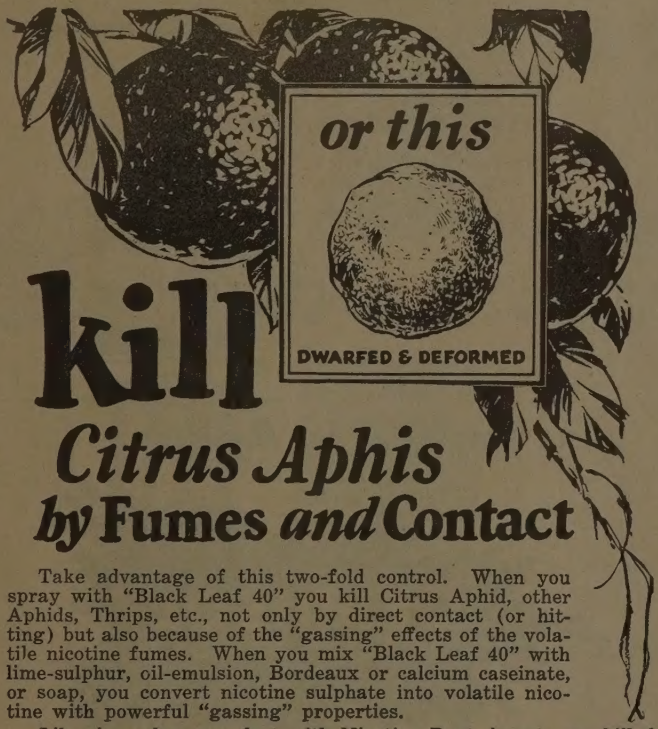

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